User Manual

DeviceNet™
Discrete Input Module
"DN" - Harsh Environment Series

Model DN003

Electronic Innovation Inc.
1130 Webbwood Dr., Unit A
Sudbury, Ontario
Canada
P3C 3B7

Phone: (705) 673-9404
Fax: (705) 673-3811
email: info@ElectronicInnovation.ca

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ELECTRONIC INNOVATION Inc.

1130 Webbwood Dr., Unit A
Sudbury, Ontario
Canada
P3C 3B7

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1. Module Description

The Electronic Innovation Inc. “DN” line of modules are intended to provide rugged, reliable, *DeviceNet*™ I/O capability in unusually harsh environments. These include applications such as on-board control of heavy underground mobile mining equipment or armoured military vehicles.

The DN line has been designed from the ground up to survive these environments with special attention in the following areas:

a) Mechanical design for high shock, vibration, and concussion tolerance, resistance to liquids such as water or oil, and most forms of corrosion, along with wide operating temperatures.
b) Electrical design to exceed Mil-Spec. standard reliable operation in the face of severe electrical transients such as the load-dump transient which can occur on heavy vehicle electrical systems.
c) Electronic design to minimize electromagnetic emissions and provide low susceptibility to external electromagnetic interference.
d) Extensive design effort has been expended to ensure that hardware, software, or network faults, if and when they occur, will result in a predictable and timely transition of the module to the safest achievable state.

The DN003 *DeviceNet*™ Discrete Input Module provides a total of 16 inputs. These are well suited to monitor discrete inputs in a harsh mobile environment. The inputs have extensive protection circuitry to provide tolerance to electrical transients. System-wide fail-to-safe design is facilitated by the ability to individually configure the hardware to either “pull-high” or “pull-low” in response to an unconnected input.

2. Module Configuration

The DN003 module must be configured for proper operation on the DeviceNet network. This module operates as a Group 2 Only Server, UCMM Incapable Device, and therefore communicates using the Predefined Master/Slave Connection Set. Supported message types include I/O Poll, Bit Strobe, and Explicit. Change of State and Cyclic message types are not supported in this version of the DN003.

The baud rate and MAC ID may need to be changed from their default shipping values before the module will operate properly on the target network. For the DN003, the only way to change these values is with software using any DeviceNet compliant configuration tool capable of allocating the module and accessing its attributes.

The Unconnected Input State may be individually specified for each input if desired.

All of the above configurations, when changed, are automatically stored in a non-volatile EEPROM. The configuration of the module is not lost when the module is powered down, or, if the module undergoes a reset.

3. Module Operation

Once configured, the DN003 is ready to start collecting data to be sent to the master. The DN003 is factory calibrated; no further calibration is necessary.

The master obtains input values using either I/O Poll, Bit Strobe, or Explicit message types. These message types are described below.

3.1 I/O Poll Messages

The master issues I/O Poll Request messages to the DN003. The data portion of the slave I/O Poll Response message contains the states of the discrete inputs bit mapped into two bytes in every I/O Poll Response message as shown below.

1								2							
D8	D7	D6	D5	D4	D3	D2	D1	D16	D15	D14	D13	D12	D11	D10	D9

where Dx is the discrete input from channel "x" x = 1..16

3.2 Bit-Strobe Poll Messages

The master may issue a Bit-Strobe Request message soliciting data from more than one module in a single request message. If the bit number corresponding to the module's MAC ID is set, the module will respond with a packet containing the same information as provided by an I/O Poll Response. The data portion of the slave I/O Poll Response message contains the states of the discrete inputs bit mapped into two bytes in every I/O Poll Response message as shown below.

1								2							
D8	D7	D6	D5	D4	D3	D2	D1	D16	D15	D14	D13	D12	D11	D10	D9

where Dx is the discrete input from channel "x" x = 1..16

3.3 Explicit Messages

The master can also get the discrete data from each input individually by getting attribute 3 (Value) from the corresponding DIP object.

4 Module Calibration

There are no calibrations possible on the DN003 Discrete Input Module.

Appendix A: Statement of Compliance

A.1 General Device Data

Conforms to DeviceNet Specification	Volume I, Release 2.0 Volume II, Release 2.0
Vendor Name	Electronic Innovation Inc.
Device Profile Name	Generic Device
Product Catalog Number	DN003
Product Revision	Hardware Ver. 1.3 Software Ver. 2.82

A.2 DeviceNet Physical Conformance Data

Max. Network Power Consumption	0.15A @ 11 VDC (worst case)
Connector Style	
DN003-OF	Open-Pluggable
DN003-SSE	Sealed-Mini
LED Supported	Combo Mod/Net Status
MAC ID Setting	Software Selectable
Default MAC ID	63
Communication Rate Setting	Software Selectable
Communication Rates Supported	125 kbps, 250 kbps, 500 kbps

A.3 DeviceNet Communications Data

Predefined Master/Slave Connection Set	Supported, Group 2 Only Server
Dynamic Connections Supported (UCMM)	None
Fragmented Explicit Messaging Supported	No

A.4 DeviceNet Information

The DN003 operates as a slave device on a DeviceNet network. It supports Explicit Messages, Bit Strobe Messages, and Polled I/O Messages of the Predefined Master/Slave Connection Set. It does not support the Explicit Unconnected Message Manager (UCMM)

DeviceNet Message Types

As a Group 2 Slave device the DN003 supports the following message types

CAN Identifier Field	Group 2 Message Type
10xxxxxx000	Master I/O Bit-Strobe Command Msg
10xxxxxx100	Master Explicit Request Message
10xxxxxx101	Master I/O Poll Command Message
10xxxxxx110	Group 2 Only Unconnected Explicit Request Message
10xxxxxx111	Duplicate MAC ID Check Messages

xxxxxx = DN003 Node Address (0..63)

DeviceNet Class Services

As a Group 2 Slave device, the DN003 module supports the following class and instance services.

Service Code	Service Name
0x05 $_{HEX}$	Reset
0x0E $_{HEX}$	Get_Attribute_Single
0x10 $_{HEX}$	Set_Attribute_Single
0x4B $_{HEX}$	Allocate_Master/Slave_Connection_Set
0x4C $_{HEX}$	Release_Master/Slave_Connection_Set

DeviceNet Object Classes

The DN003 module supports the following DeviceNet Object classes

Class Code	Service Name
0x01 $_{HEX}$	Identity Object
0x02 $_{HEX}$	Message Router Object
0x03 $_{HEX}$	DeviceNet Object
0x04 $_{HEX}$	Assembly Object
0x05 $_{HEX}$	Connection Object
0x08 $_{HEX}$	Discrete Input Point Object

A.5 DeviceNet Required Object Implementation

Identity Object   Class Code: 01_{HEX}

The Identity Object is required on all devices and provided identification and general information about the device.

Object Class

Attribute ID	Access Rule	Name	DeviceNet Data Type	Value
1	Get	Revision	UINT	1

Number of Instances: 1
Object Instance

Attribute ID	Access Rule	Name	DeviceNet Data Type	Value
1	Get	Vendor ID	UINT	285
2	Get	Device Type	UINT	0
3	Get	Product Code	UINT	3
4	Get	Revision Major Revision Minor Revision	STRUCT of: USINT USINT	 2 82
5	Get	Status	WORD	see DeviceNet Specification
6	Get	Serial Number	UDINT	32 bit serial number
7	Get	Product Name	SHORT_STRING	DN003

Common Services

Service Code	Implemented for:		Service Name
	Class	Instance	
5 (05_{HEX})	No	Yes	Reset
14 ($0E_{HEX}$)	Yes	Yes	Get_Attribute_Single

Message Router Object Class Code: 02_{HEX}

The Message Router Object provides a messaging connection point through which a Client may address a service to any object class or instance residing in the physical device.

Object Class

Attribute ID	Access Rule	Name	DeviceNet Data Type	Value
1	Get	Revision	UINT	1

Number of Instances: 1
Object Instance

Attribute ID	Access Rule	Name	DeviceNet Data Type	Value
2	Get	Number of Connections	UINT	2

Common Services

Service Code	Implemented for:		Service Name
	Class	Instance	
14 ($0E_{HEX}$)	Yes	Yes	Get_Attribute_Single

DeviceNet Object Class Code: 03_{HEX}

The DeviceNet Object is required on all devices and is used to provide the configuration and status of a physical attachment to DeviceNet.

Object Class

Attribute ID	Access Rule	Name	DeviceNet Data Type	Value
1	Get	Revision	UINT	2

Number of Instances: 1
Object Instance

Attribute ID	Access Rule	Name	DeviceNet Data Type	Value
1	Get/Set	MAC ID	USINT	Range 0 to 63*
2	Get/Set	Data Rate	USINT	0* = 125 kbps 1 = 250 kbps 2 = 500 kbps
3	Get/Set	Bus-Off Interrupt (BOI)	BOOL	0* = Hold CAN chip in Bus off (default) 1 = Reset CAN chip if possible
4	Get/Set	Bus-Off Counter	USINT	Range 0 to 255
5	Get	Allocation Information Alloc. Choice Byte Master's MAC ID	STRUCT of: BYTE USINT	 Alloc. Choice Table Range 0..63, 255 255 = not allocated

*Factory default

Alloc. Choice Table

Bit	Service	Value
0	Explicit Message	Supported. Set to 1 to allocate
1	I/O Poll	Supported. Set to 1 to allocate
2	Bit Strobe	Supported. Set to 1 to allocate
3	-	Reserved. Always 0
4	Change of State	Not Supported. Always 0
5	Cyclic	Not Supported. Always 0
6	Acknowledge Suppression	Always 0
7	-	Reserved. Always 0

Common Services

Service Code	Implemented for:		Service Name
	Class	Instance	
14 ($0E_{HEX}$)	Yes	Yes	Get_Attribute_Single
16 (10_{HEX})	No	Yes	Set_Attribute_Single
75 ($4B_{HEX}$)	No	Yes	Allocate_Master_Slave_Connection_Set
76 ($4C_{HEX}$)	No	Yes	Release_Master_Slave_Connection_Set

Assembly Object Class Code: 04_{HEX}

The Assembly Object binds attributes of multiple objects which allows data to or from each object to be sent or received over a single connection.

Object Class

Attribute ID	Access Rule	Name	DeviceNet Data Type	Value
1	Get	Revision	UINT	2

Number of Instances: 1
Object Instance

Attribute ID	Access Rule	Name	DeviceNet Data Type	Value
3	Get	Data	BYTE Array	*Output Status Byte*

Common Services

Service Code	Implemented for:		Service Name
	Class	Instance	
14 ($0E_{HEX}$)	Yes	Yes	Get_Attribute_Single

Connection Object Class Code: 05_{HEX}

The Connection Object manages the characteristics of each communication connection. As a Group 2 Only Slave device, the module supports one Explicit Message connection and one I/O Poll Message connection. Attribute 100 of instance 1, 2 and 3 will be set for all instances when only one of the instances is changed. For example, setting Instance 2, Attribute 100 to 1, will also set Instance 1 and Instance 3, Attribute 100 to 1. The values can not be different.

Object Class

Attribute ID	Access Rule	Name	DeviceNet Data Type	Value
1	Get	Revision	UINT	1

Number of Instances: 3
Object Instance 1 – Explicit Messaging

Attribute ID	Access Rule	Name	DeviceNet Data Type	Value
1	Get	State	USINT	0 = Non-existent 3 = Established 5 = Deferred Delete
2	Get	Instance Type	USINT	0 = Explicit Messaging
3	Get	Transport Class Trigger	BYTE	83_{HEX}
4	Get	Produced Connection ID	UINT	$10xxxxxx011_{BIN}$ xxxxxx = DN003 MAC ID
5	Get	Consumed Connection ID	UINT	$10xxxxxx100_{BIN}$ xxxxxx = DN003 MAC ID
6	Get	Initial Comm. Characteristics	BYTE	21_{HEX}
7	Get	Produced Connection Size	UINT	7
8	Get	Consumed Connection Size	UINT	7
9	Get/Set	Expected Packet Rate	UINT	2500 ms
12	Get/Set	Watchdog Timeout Action	USINT	1 (Auto Delete) 3 (Deferred Delete)
13	Get	Produced Connection Path Length	UINT	0
14	Get	Produced Connection Path	Array of USINT	Null (no data)
15	Get	Consumed Connection Path Length	UINT	0
16	Get	Consumed Connection Path	Array of USINT	Null (no data)
17	Get	Production Inhibit Time	UINT	0 (no inhibit time)

100	Get/Set	Counter State	BOOL	0* Counters Off 1 Counters On

Object Instance 2 – I/O Poll

Attribute ID	Access Rule	Name	DeviceNet Data Type	Value
1	Get	State	USINT	0 = Non-existent 1 = Configuring 3 = Established 4 = Timed Out
2	Get	Instance Type	USINT	1 = I/O Messaging
3	Get	Transport Class Trigger	BYTE	82_{HEX}
4	Get	Produced Connection ID	UINT	$01111xxxxxx_{BIN}$ xxxxxx = DN0023MAC ID
5	Get	Consumed Connection ID	UINT	$10xxxxxx101_{BIN}$ xxxxxx = DN0023MAC ID
6	Get	Initial Comm. Characteristics	BYTE	01_{HEX}
7	Get	Produced Connection Size	UINT	2 (8 for the DN003-3C)
8	Get	Consumed Connection Size	UINT	0
9	Get/Set	Expected Packet Rate	UINT	200 ms
12	Get/Set	Watchdog Timeout Action	USINT	0* (Timeout) 1 (Auto Delete) 2 (Auto Reset)
13	Get	Produced Connection Path Length	UINT	6
14	Get	Produced Connection Path	Array of USINT	$\{20, 04, 24, 64, 30, 03\}_{HEX}$
15	Get	Consumed Connection Path Length	UINT	6
16	Get	Consumed Connection Path	Array of USINT	$\{20, 04, 24, 64, 30, 03\}_{HEX}$
17	Get	Production Inhibit Time	UINT	0 (no inhibit time)
100	Get/Set	Counter State	BOOL	0* Counters Off 1 Counters On

Object Instance 2 – I/O Bit-Strobe

Attribute ID	Access Rule	Name	DeviceNet Data Type	Value
1	Get	State	USINT	0 = Non-existent 1 = Configuring 3 = Established 4 = Timed Out
2	Get	Instance Type	USINT	1 = I/O Messaging

3	Get	Transport Class Trigger	BYTE	82_{HEX}
4	Get	Produced Connection ID	UINT	$01110xxxxxx_{BIN}$ xxxxxx = DN003 MAC ID
5	Get	Consumed Connection ID	UINT	$10xxxxxx000_{BIN}$ xxxxxx = Master MAC ID
6	Get	Initial Comm. Characteristics	BYTE	02_{HEX}
7	Get	Produced Connection Size	UINT	2 (8 for the DN003-3C)
8	Get	Consumed Connection Size	UINT	8
9	Get/Set	Expected Packet Rate	UINT	200 ms
12	Get/Set	Watchdog Timeout Action	USINT	0* (Timeout) 1 (Auto Delete) 2 (Auto Reset)
13	Get	Produced Connection Path Length	UINT	6
14	Get	Produced Connection Path	Array of USINT	$\{20, 04, 24, 64, 30, 03\}_{HEX}$
15	Get	Consumed Connection Path Length	UINT	6
16	Get	Consumed Connection Path	Array of USINT	$\{20, 04, 24, 64, 30, 03\}_{HEX}$
17	Get	Production Inhibit Time	UINT	0 (no inhibit time)
100	Get/Set	Counter State	BOOL	0* Counters Off 1 Counters On

Common Services

Service Code	Implemented for:		Service Name
	Class	Instance	
5 (05_{HEX})	No	Yes	Reset
14 ($0E_{HEX}$)	Yes	Yes	Get_Attribute_Single
16 (10_{HEX})	No	Yes	Set_Attribute_Single

A.6 DeviceNet Open Object Implementation

Discrete Input Point Object Class Code: 08_{HEX}

The Discrete Input Point (DIP) models the point level attributes and services of the analog outputs in the DN003. In order for make frequency or pulse accumulator values available, Attribute 100, of Instance 1,2 or 3 of the Connection Object must be set to 1.

Object Class

Attribute ID	Access Rule	Name	DeviceNet Data Type	Value
1	Get	Revision	UINT	2
2	Get	Max. Object Instance	UINT	16

Number of Instances: 16
Object Instances 1 thru 16

Attribute ID	Access Rule	Name	DeviceNet Data Type	Value
3	Get	Value	BOOL	Measured Value
100	Get/Set	Hardware Pull Up/Down	BOOL	0* = hdw pull-down 1 = hdw pull-up
101	Get/Set	Counter Value	UINT	Measured Value, depends on attribute 102
102	Get/Set	Counter Mode	UINT	0 = No Counter 1 = Frequency Mode 2 = Accumulator Mode

*Factory default

Common Services

Service Code	Implemented for:		Service Name
	Class	Instance	
14 ($0E_{HEX}$)	Yes	Yes	Get_Attribute_Single
16 (10_{HEX})	No	Yes	Set_Attribute_Single

Appendix B: Electronic Data Sheet (EDS) Listing

```
$ Electronic Innovation Inc.
$ DN003 - 16 Discrete Input Module - EDS


[File]
    DescText=   "DN003 EDS";
    CreateDate= 8-11-2000;
    CreateTime= 10:00:00;
    ModDate=    8-11-2000;
    ModTime=    10:00:00;
    Revision=   2.0;


[Device]
    VendCode=   285;
    ProdType=   0;
    ProdCode=   3;
    MajRev=     2;
    MinRev=     1;
    VendName=   "Electronic Innovation Inc.";
    ProdTypeStr="Generic Device";
    ProdName=   "DN003";
    Catalog=    "DN003";


[IO_Info]
    Default=    0x0001;
    PollInfo=   0x0003,1,0;
    StrobeInfo= 0x0003,1,1;

    Input1=     2,0,0x0003,"Producing IO/Data",6,"20 04 24 64 30 03","Poll & BitS Prod";
    Output1=    8,0,0x0003,"Consuming BitS/Data",6,"20 04 24 64 30 03","BitS Cons";


[ParamClass]
    MaxInst=16;
    Descriptor=0;
    CfgAssembly=0;


[Params]
    $ ------------------------------------------------------------------------------ $
    $                                 CHANNEL 1                                      $
    $ ------------------------------------------------------------------------------ $
    Param1=
       0,                            $ reserved
       6, "20 08 24 1 30 64",        $ link size and path
       0x02,                         $ descriptor
       0xC1, 1,                      $ data type, data size (in bytes)
       "Hdw Pull Down/Up 1",         $ parameter name
       "N/A",                        $ units string
       "Shutdown Action",            $ help string
       0,1,0,                        $ minimum, maximum and default values
        , , , , , , , , ;            $ optional fields

    $ ------------------------------------------------------------------------------ $
    $                                 CHANNEL 2                                      $
    $ ------------------------------------------------------------------------------ $
    Param2=
       0,                            $ reserved
       6, "20 08 24 2 30 64",        $ link size and path
       0x02,                         $ descriptor
       0xC1, 1,                      $ data type, data size (in bytes)
       "Hdw Pull Down/Up 2",         $ parameter name
       "N/A",                        $ units string
       "Shutdown Action",            $ help string
```

```
   0,1,0,                      $ minimum, maximum and default values
    , , , , , , , , ;          $ optional fields

$ ----------------------------------------------------------------------------- $
$                                  CHANNEL 3                                    $
$ ----------------------------------------------------------------------------- $
Param3=
   0,                          $ reserved
   6, "20 08 24 3 30 64",      $ link size and path
   0x02,                       $ descriptor
   0xC1, 1,                    $ data type, data size (in bytes)
   "Hdw Pull Down/Up 3",         $ parameter name
   "N/A",                      $ units string
   "Shutdown Action",          $ help string
   0,1,0,                      $ minimum, maximum and default values
    , , , , , , , , ;          $ optional fields

$ ----------------------------------------------------------------------------- $
$                                  CHANNEL 4                                    $
$ ----------------------------------------------------------------------------- $
Param4=
   0,                          $ reserved
   6, "20 08 24 4 30 64",      $ link size and path
   0x02,                       $ descriptor
   0xC1, 1,                    $ data type, data size (in bytes)
   "Hdw Pull Down/Up 4",       $ parameter name
   "N/A",                      $ units string
   "Shutdown Action",          $ help string
   0,1,0,                      $ minimum, maximum and default values
    , , , , , , , , ;          $ optional fields

$ ----------------------------------------------------------------------------- $
$                                  CHANNEL 5                                    $
$ ----------------------------------------------------------------------------- $
Param5=
   0,                          $ reserved
   6, "20 08 24 5 30 64",      $ link size and path
   0x02,                       $ descriptor
   0xC1, 1,                    $ data type, data size (in bytes)
   "Hdw Pull Down/Up 5",       $ parameter name
   "N/A",                      $ units string
   "Shutdown Action",          $ help string
   0,1,0,                      $ minimum, maximum and default values
    , , , , , , , , ;          $ optional fields

$ ----------------------------------------------------------------------------- $
$                                  CHANNEL 6                                    $
$ ----------------------------------------------------------------------------- $
Param6=
   0,                          $ reserved
   6, "20 08 24 6 30 64",      $ link size and path
   0x02,                       $ descriptor
   0xC1, 1,                    $ data type, data size (in bytes)
   "Hdw Pull Down/Up 6",       $ parameter name
   "N/A",                      $ units string
   "Shutdown Action",          $ help string
   0,1,0,                      $ minimum, maximum and default values
    , , , , , , , , ;          $ optional fields

$ ----------------------------------------------------------------------------- $
$                                  CHANNEL 7                                    $
$ ----------------------------------------------------------------------------- $
Param7=
   0,                          $ reserved
   6, "20 08 24 7 30 64",      $ link size and path
   0x02,                       $ descriptor
   0xC1, 1,                    $ data type, data size (in bytes)
   "Hdw Pull Down/Up 7",       $ parameter name
   "N/A",                      $ units string
   "Shutdown Action",          $ help string
```

```
   0,1,0,                        $ minimum, maximum and default values
    , , , , , , , , ;            $ optional fields

$ ----------------------------------------------------------------------------- $
$                                  CHANNEL 8                                     $
$ ----------------------------------------------------------------------------- $
Param8=
   0,                            $ reserved
   6, "20 08 24 8 30 64",        $ link size and path
   0x02,                         $ descriptor
   0xC1, 1,                      $ data type, data size (in bytes)
   "Hdw Pull Down/Up 8",         $ parameter name
   "N/A",                        $ units string
   "Shutdown Action",            $ help string
   0,1,0,                        $ minimum, maximum and default values
    , , , , , , , , ;            $ optional fields

$ ----------------------------------------------------------------------------- $
$                                  CHANNEL 9                                     $
$ ----------------------------------------------------------------------------- $
Param9=
   0,                            $ reserved
   6, "20 08 24 9 30 64",        $ link size and path
   0x02,                         $ descriptor
   0xC1, 1,                      $ data type, data size (in bytes)
   "Hdw Pull Down/Up 9",         $ parameter name
   "N/A",                        $ units string
   "Shutdown Action",            $ help string
   0,1,0,                        $ minimum, maximum and default values
    , , , , , , , , ;            $ optional fields

$ ----------------------------------------------------------------------------- $
$                                  CHANNEL 10                                    $
$ ----------------------------------------------------------------------------- $
Param10=
   0,                            $ reserved
   6, "20 08 24 A 30 64",        $ link size and path
   0x02,                         $ descriptor
   0xC1, 1,                      $ data type, data size (in bytes)
   "Hdw Pull Down/Up 10",        $ parameter name
   "N/A",                        $ units string
   "Shutdown Action",            $ help string
   0,1,0,                        $ minimum, maximum and default values
    , , , , , , , , ;            $ optional fields

$ ----------------------------------------------------------------------------- $
$                                  CHANNEL 11                                    $
$ ----------------------------------------------------------------------------- $
Param11=
   0,                            $ reserved
   6, "20 08 24 B 30 64",        $ link size and path
   0x02,                         $ descriptor
   0xC1, 1,                      $ data type, data size (in bytes)
   "Hdw Pull Down/Up 11",        $ parameter name
   "N/A",                        $ units string
   "Shutdown Action",            $ help string
   0,1,0,                        $ minimum, maximum and default values
    , , , , , , , , ;            $ optional fields

$ ----------------------------------------------------------------------------- $
$                                  CHANNEL 12                                    $
$ ----------------------------------------------------------------------------- $
Param12=
   0,                            $ reserved
   6, "20 08 24 C 30 64",        $ link size and path
   0x02,                         $ descriptor
   0xC1, 1,                      $ data type, data size (in bytes)
   "Hdw Pull Down/Up 12",        $ parameter name
   "N/A",                        $ units string
   "Shutdown Action",            $ help string
```

```
      0,1,0,                         $ minimum, maximum and default values
       , , , , , , , , ;             $ optional fields

   $ ------------------------------------------------------------------------------ $
   $                                  CHANNEL 13                                    $
   $ ------------------------------------------------------------------------------ $
   Param13=
      0,                             $ reserved
      6, "20 08 24 D 30 64",         $ link size and path
      0x02,                          $ descriptor
      0xC1, 1,                       $ data type, data size (in bytes)
      "Hdw Pull Down/Up 13",         $ parameter name
      "N/A",                         $ units string
      "Shutdown Action",             $ help string
      0,1,0,                         $ minimum, maximum and default values
       , , , , , , , , ;             $ optional fields

   $ ------------------------------------------------------------------------------ $
   $                                  CHANNEL 14                                    $
   $ ------------------------------------------------------------------------------ $
   Param14=
      0,                             $ reserved
      6, "20 08 24 E 30 64",         $ link size and path
      0x02,                          $ descriptor
      0xC1, 1,                       $ data type, data size (in bytes)
      "Hdw Pull Down/Up 14",         $ parameter name
      "N/A",                         $ units string
      "Shutdown Action",             $ help string
      0,1,0,                         $ minimum, maximum and default values
       , , , , , , , , ;             $ optional fields

   $ ------------------------------------------------------------------------------ $
   $                                  CHANNEL 15                                    $
   $ ------------------------------------------------------------------------------ $
   Param15=
      0,                             $ reserved
      6, "20 08 24 F 30 64",         $ link size and path
      0x02,                          $ descriptor
      0xC1, 1,                       $ data type, data size (in bytes)
      "Hdw Pull Down/Up 15",         $ parameter name
      "N/A",                         $ units string
      "Shutdown Action",             $ help string
      0,1,0,                         $ minimum, maximum and default values
       , , , , , , , , ;             $ optional fields

   $ ------------------------------------------------------------------------------ $
   $                                  CHANNEL 16                                    $
   $ ------------------------------------------------------------------------------ $
   Param16=
      0,                             $ reserved
      6, "20 08 24 10 30 64",        $ link size and path
      0x02,                          $ descriptor
      0xC1, 1,                       $ data type, data size (in bytes)
      "Hdw Pull Down/Up 16",         $ parameter name
      "N/A",                         $ units string
      "Shutdown Action",             $ help string
      0,1,0,                         $ minimum, maximum and default values
       , , , , , , , , ;             $ optional fields


[EnumPar]
   Param1="Pull-Down","Pull-Up";
   Param2="Pull-Down","Pull-Up";
   Param3="Pull-Down","Pull-Up";
   Param4="Pull-Down","Pull-Up";
   Param5="Pull-Down","Pull-Up";
   Param6="Pull-Down","Pull-Up";
   Param7="Pull-Down","Pull-Up";
   Param8="Pull-Down","Pull-Up";
```

```
    Param9="Pull-Down","Pull-Up";
    Param10="Pull-Down","Pull-Up";
    Param11="Pull-Down","Pull-Up";
    Param12="Pull-Down","Pull-Up";
    Param13="Pull-Down","Pull-Up";
    Param14="Pull-Down","Pull-Up";
    Param15="Pull-Down","Pull-Up";
    Param16="Pull-Down","Pull-Up";

[Groups]
    Group1 = "DIP Object",16,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16;
```

Appendix C: Specifications

DeviceNet Power Supply:

Power Supply Voltage:	8.8 V to 65.0 V, continuous operating
Power Supply Isolation:	1.2kVrms
Current Consumption:	200 mA @ 8.8 V Supply 150 mA @ 11.0 V Supply 80 mA @ 25.0 V Supply
Overvoltage Withstand:	120V, 20 seconds
Operation During Overvoltage:	Module operation maintained without disruption throughout transient
Applicable Military Standard:	Exceeds Quadripartite Standardization Agreement 307, Annex B (28VDC Military Vehicles), including Load-Dump Transient protection.

Discrete Inputs (nominal 24 VDC):

Low Level Input (min.):	-110V
Low Level Input (max.):	4.8 V
High Level Input (min.):	6.0 V
High Level Input (max.):	110 V
Input Current @24V(max):	250 µA
Unconnected Input:	may be configured to pull eiither high or low when unconnected

Communications:

Data Rates Supported:	125 kbps, 250 kbps, 500 kbps
Maximum Distances:	500 m (1,640 ft) at 125 kbps 200 m (650 ft) at 250 kbps 100 m (330 ft) at 500 kbps

Electromagnetic Interference Control:

Emissions: Meets MIL-STD 461D: RE102, Navy Mobile and Army
Susceptibility: Meets MIL-STD 461D: RS103, Ground Vehicles
Note: Only –SSE enclosure option is qualified to MIL-STD 461D EMI Limits

Environmental

Operating Temperature:	-40°C to +85°C
Storage Temperature:	-55°C to +125°C

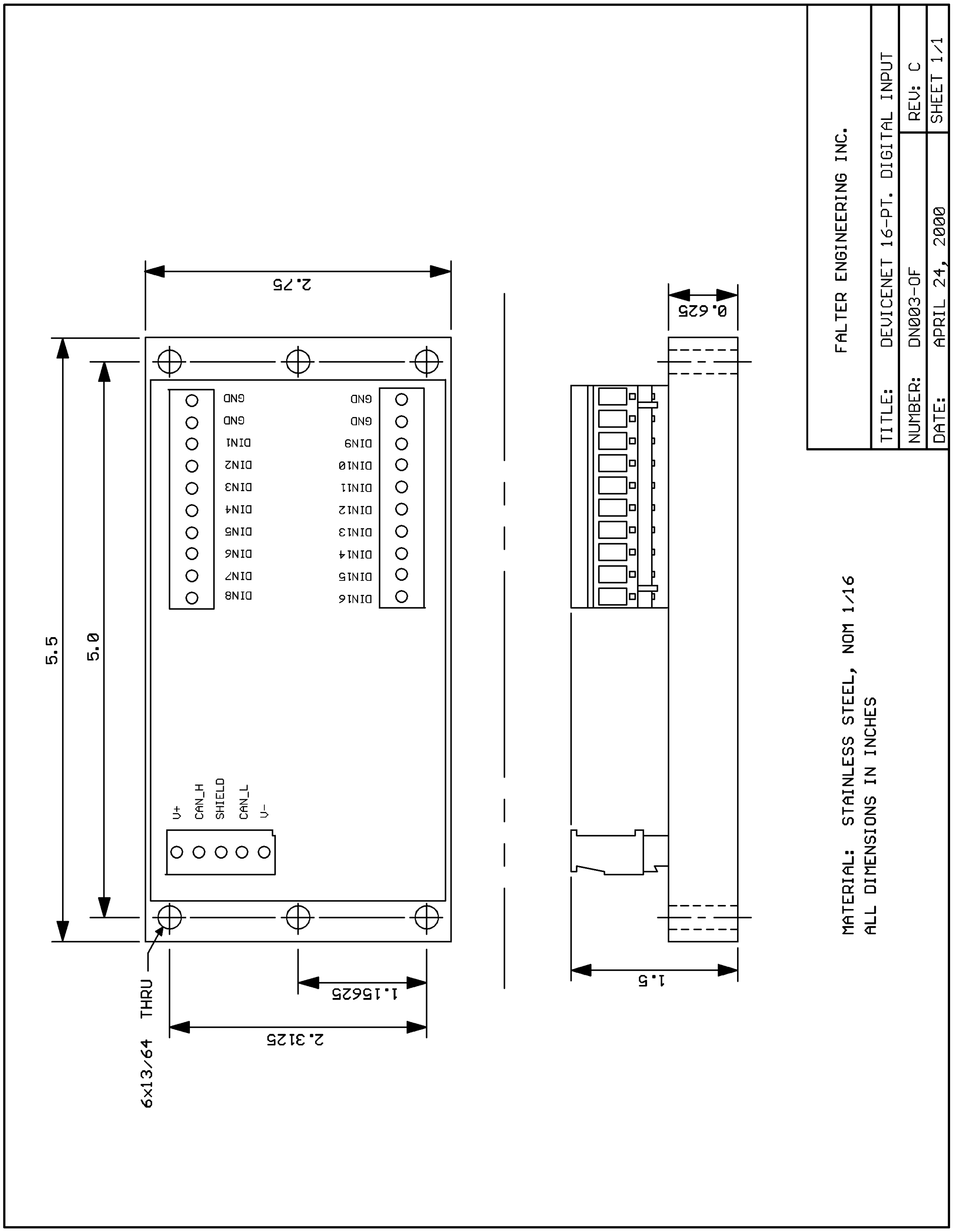
Shipping Configuration:

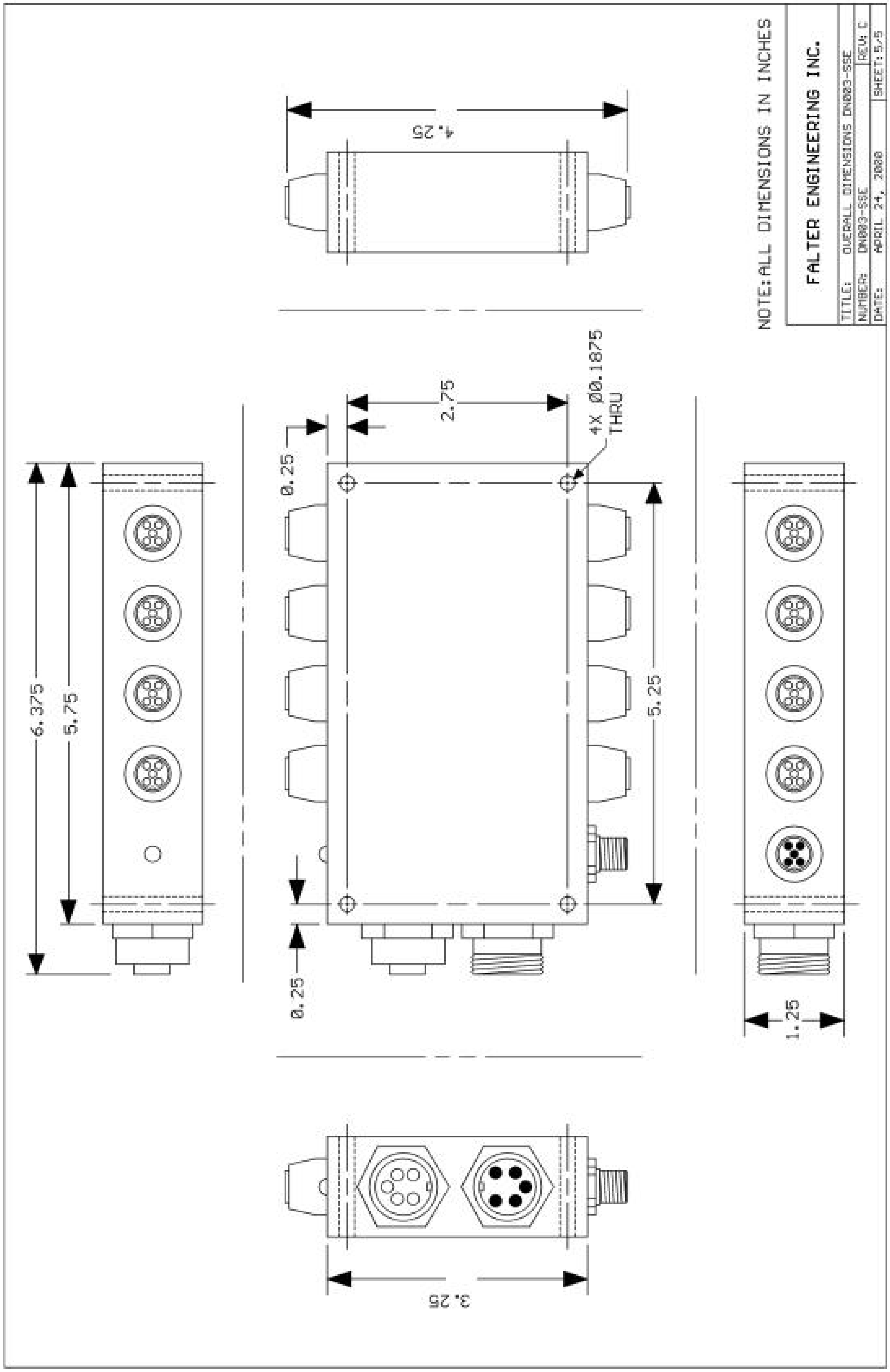
MAC ID:	63
Data Rate:	125 kbps
Discrete I/O Pull Up/Down:	All pull-down

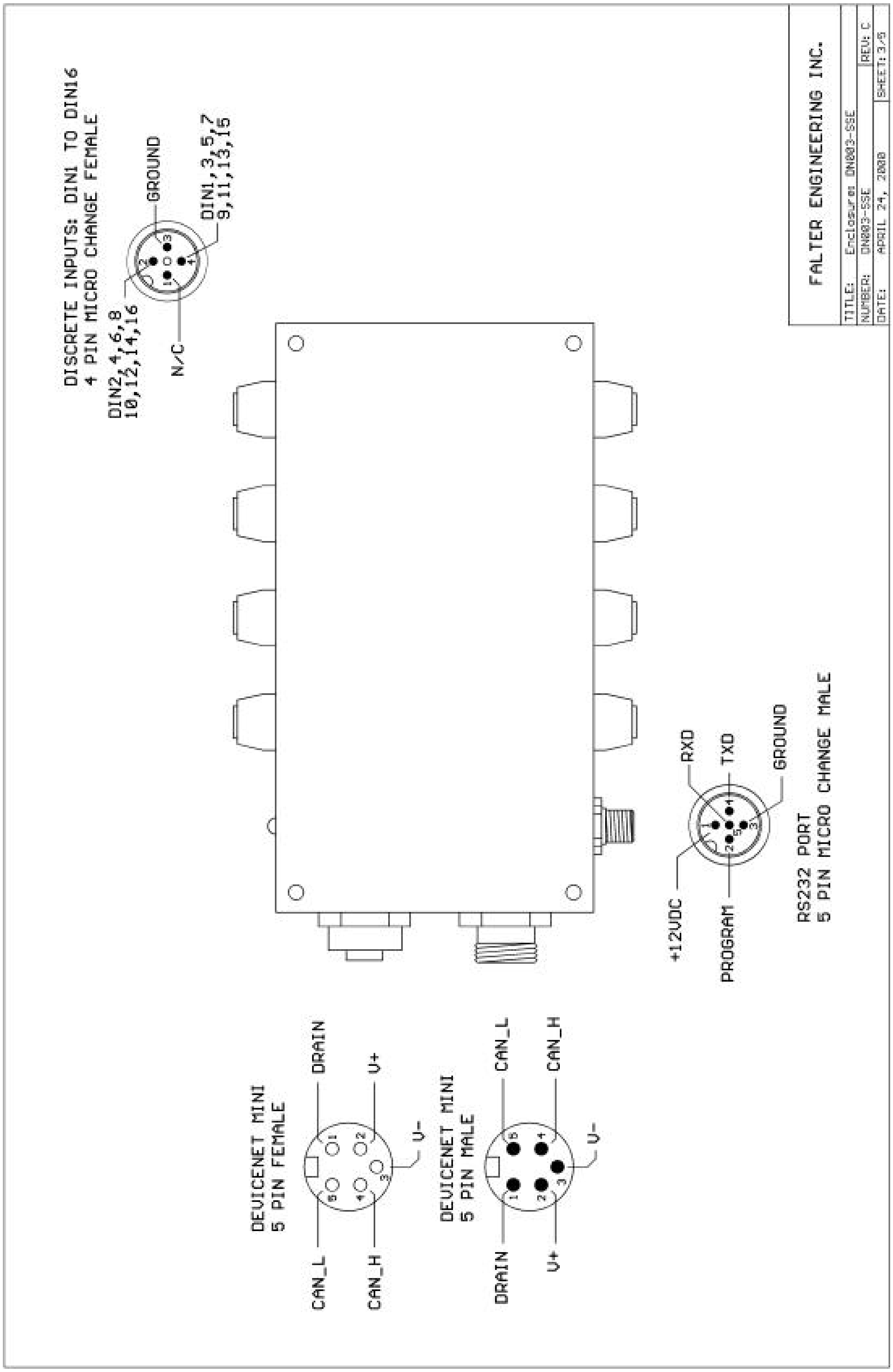
Ordering Information

DN003-OF	Potted into Open Frame stainless steel tray, Terminal block connectors
DN003-SSE	Potted into Stainless Steel Enclosure, sealed stainless steel Mini-style DeviceNet and Aux. connectors, sealed stainless steel micro-style connectors for outputs

Appendix D: Mechanical Drawings




NOTE: ALL DIMENSIONS IN INCHES
FALTER ENGINEERING INC.
TITLE: OVERALL DIMENSIONS DN003-SSE
NUMBER: DN003-SSE
REV: C
DATE: APRIL 24, 2000
SHEET: 5/5
4.25
2.75
4X Ø0.1875 THRU
0.25
0.25
6.375
5.75
5.25
1.25
3.25


DISCRETE INPUTS: DIN1 TO DIN16
4 PIN MICRO CHANGE FEMALE
GROUND
DIN1,3,5,7
9,11,13,15
DIN2,4,6,8
10,12,14,16
N/C
RXD
TXD
GROUND
+12VDC
PROGRAM
RS232 PORT
5 PIN MICRO CHANGE MALE
DEVICENET MINI
5 PIN FEMALE
DRAIN
V+
V-
CAN_L
CAN_H
DEVICENET MINI
5 PIN MALE
CAN_L
CAN_H
V-
DRAIN
V+
FALTER ENGINEERING INC.
TITLE: Enclosure: DN003-SSE
NUMBER: DN003-SSE
DATE: APRIL 24, 2000
REV: C
SHEET: 3/5